

Non-Catalog Model

Frequency Mixer

LRMS-5LHJ

Level 10 (LO Power +10 dBm)

Important Note

This is a non-catalog model and can be manufactured on specific request.
Pricing and delivery information can be supplied upon request.



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CASE STYLE : QQQ569

ELECTRICAL SPECIFICATIONS 50Ω @ +25°C					
Parameter		Min.	Typ.	Max.	Units
Frequency	LO (fL to fU)	10		1500	MHz
	RF (fL to fU)	10		1500	MHz
	IF	0		900	MHz
Conversion Loss	mid band		5.3	8.0	dB
	Total Range			9.8	dB
LO-RF Isolation	Low Range	35	58		dB
	Mid Range	20	38		dB
	Upper Range	18	25		dB
LO-IF Isolation	Low Range	30	56		dB
	Mid Range	14	38		dB
	Upper Range	6	17		dB
1 dB Comp. Input Power			+5		dBm

Notes: Low Range = [fL to 10fL]
mid band = [2fL to fU/2]

Mid Range = [10fL to fU/2]

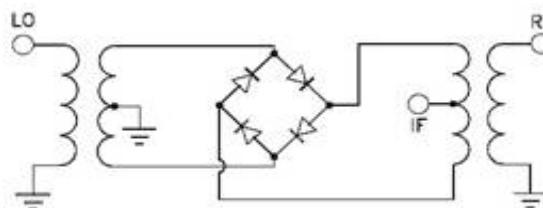
Upper Range = [fU/2 to fU]

Phase detection, positive polarity
Aqueous washable.

MAXIMUM RATINGS	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA

PIN CONNECTIONS	
LO	1
RF	4
IF	5
GROUND	2, 3, 6

Electrical Schematics



Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	6.08	5.72	5.53
49.6	79.6	6.02	5.59	5.40
89.1	119.1	5.86	5.45	5.30
128.7	158.7	5.85	5.49	5.36
168.2	198.2	5.87	5.51	5.37
207.7	237.7	5.85	5.51	5.36
247.2	277.2	5.95	5.59	5.42
286.7	316.7	5.97	5.60	5.41
326.2	356.2	6.04	5.65	5.47
365.8	395.8	6.11	5.71	5.49
405.3	435.3	6.12	5.71	5.53
444.8	474.8	6.24	5.79	5.56
484.3	514.3	6.26	5.85	5.60
523.8	553.8	6.33	5.88	5.67
563.4	593.4	6.41	5.89	5.62
602.9	632.9	6.51	5.97	5.65
642.4	672.4	6.62	6.11	5.75
681.9	711.9	6.69	6.23	5.91
721.4	751.4	6.82	6.36	6.10
760.9	790.9	6.86	6.34	6.11
800.5	830.5	7.03	6.40	6.15
840.0	870.0	7.29	6.51	6.21
879.5	909.5	7.54	6.70	6.31
919.0	949.0	7.86	6.99	6.52
958.5	988.5	8.13	7.24	6.73
998.1	1028.1	8.45	7.63	7.05
1037.6	1067.6	8.75	8.08	7.49
1077.1	1107.1	9.05	8.58	8.08
1116.6	1146.6	9.13	8.83	8.49
1156.1	1186.1	9.12	8.92	8.73
1195.6	1225.6	9.12	8.95	8.86
1254.9	1284.9	9.17	9.02	9.03
1294.4	1324.4	9.30	9.11	9.15
1353.7	1383.7	9.52	9.27	9.30
1393.2	1423.2	9.70	9.38	9.37
1452.5	1482.5	9.90	9.45	9.40
1492.0	1522.0	10.16	9.54	9.47
1551.3	1581.3	10.48	9.72	9.62
1590.8	1620.8	10.84	9.88	9.78
1650.1	1680.1	11.52	10.16	10.04

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	18.06	22.69	24.62
49.6	79.6	19.13	21.10	17.97
89.1	119.1	17.37	16.45	19.14
128.7	158.7	14.74	17.39	20.38
168.2	198.2	14.83	18.76	23.51
207.7	237.7	15.24	19.94	25.41
247.2	277.2	16.32	20.61	26.22
286.7	316.7	17.53	22.18	21.30
326.2	356.2	17.31	24.75	22.42
365.8	395.8	19.16	24.72	23.60
405.3	435.3	24.35	19.78	21.63
444.8	474.8	19.73	21.61	17.80
484.3	514.3	21.75	22.61	19.56
523.8	553.8	18.91	20.00	18.19
563.4	593.4	17.33	16.35	16.60
602.9	632.9	19.76	16.22	15.49
642.4	672.4	19.80	16.64	15.45
681.9	711.9	17.61	15.64	14.67
721.4	751.4	16.96	14.96	12.81
760.9	790.9	15.80	15.66	13.16
800.5	830.5	15.30	16.83	14.68
840.0	870.0	15.66	15.70	15.57
879.5	909.5	16.12	15.97	15.78
919.0	949.0	15.17	16.10	16.11
958.5	988.5	13.75	15.86	15.78
998.1	1028.1	12.72	16.65	15.35
1037.6	1067.6	11.57	15.33	16.95
1077.1	1107.1	10.77	13.24	16.88
1116.6	1146.6	10.92	11.58	14.21
1156.1	1186.1	11.86	11.61	13.54
1195.6	1225.6	12.91	11.88	13.73
1254.9	1284.9	13.40	12.78	14.01
1294.4	1324.4	13.76	13.04	14.14
1353.7	1383.7	13.64	13.60	14.07
1393.2	1423.2	12.84	13.62	14.30
1452.5	1482.5	12.70	15.16	15.34
1492.0	1522.0	12.53	15.55	15.92
1551.3	1581.3	11.97	16.20	16.09
1590.8	1620.8	11.35	14.90	15.23
1650.1	1680.1	9.80	14.13	14.72

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+5dBm (dB)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	1.12	0.86	0.69
49.6	79.6	1.64	1.30	1.18
89.1	119.1	1.77	1.43	1.26
128.7	158.7	1.76	1.48	1.29
168.2	198.2	1.74	1.44	1.27
207.7	237.7	1.85	1.55	1.37
247.2	277.2	1.84	1.55	1.38
286.7	316.7	1.94	1.62	1.49
326.2	356.2	1.96	1.68	1.53
365.8	395.8	2.06	1.78	1.62
405.3	435.3	2.14	1.87	1.69
444.8	474.8	2.20	1.92	1.78
484.3	514.3	2.32	2.01	1.88
523.8	553.8	2.33	1.99	1.82
563.4	593.4	2.42	2.16	1.97
602.9	632.9	2.41	2.18	2.02
642.4	672.4	2.47	2.19	2.06
681.9	711.9	2.57	2.22	2.09
721.4	751.4	2.53	2.17	1.99
760.9	790.9	2.62	2.25	2.04
800.5	830.5	2.48	2.20	1.95
840.0	870.0	2.41	2.24	1.97
879.5	909.5	2.28	2.19	1.93
919.0	949.0	2.11	2.09	1.87
958.5	988.5	1.95	1.99	1.89
998.1	1028.1	1.68	1.75	1.74
1037.6	1067.6	1.39	1.36	1.47
1077.1	1107.1	1.11	0.98	1.08
1116.6	1146.6	1.08	0.78	0.82
1156.1	1186.1	1.07	0.70	0.68
1195.6	1225.6	1.10	0.68	0.62
1254.9	1284.9	1.31	0.79	0.62
1294.4	1324.4	1.20	0.69	0.53
1353.7	1383.7	1.27	0.74	0.60
1393.2	1423.2	1.43	0.81	0.61
1452.5	1482.5	1.56	0.82	0.62
1492.0	1522.0	1.51	0.76	0.60
1551.3	1581.3	1.39	0.69	0.53
1590.8	1620.8	1.38	0.64	0.49
1650.1	1680.1	1.36	0.73	0.40

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=750.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+10			+10			+10
730.0	20.1	6.38	10.0	20.1	6.09	900.0	600.1	9.72
711.5	38.6	6.41	29.6	39.7	5.91	880.2	619.9	9.78
693.1	57.0	6.40	49.1	59.2	5.97	860.4	639.7	9.67
674.6	75.5	6.41	68.7	78.8	5.97	840.7	659.4	9.66
656.2	93.9	6.39	88.2	98.3	5.96	820.9	679.2	9.64
637.7	112.4	6.40	107.8	117.9	5.94	801.1	699.0	9.59
619.2	130.9	6.38	127.3	137.4	5.91	781.3	718.8	9.54
600.8	149.3	6.38	146.9	157.0	5.96	761.6	738.5	9.52
582.3	167.8	6.36	166.4	176.5	5.96	741.8	758.3	9.42
563.8	186.3	6.34	186.0	196.1	5.98	722.0	778.1	9.47
545.4	204.7	6.35	205.6	215.7	5.97	702.2	797.9	9.44
526.9	223.2	6.33	225.1	235.2	5.97	682.4	817.7	9.41
508.5	241.6	6.31	244.7	254.8	6.00	662.7	837.4	9.44
490.0	260.1	6.32	264.2	274.3	6.03	642.9	857.2	9.44
471.5	278.6	6.29	283.8	293.9	6.04	623.1	877.0	9.51
453.1	297.0	6.28	303.3	313.4	6.05	603.3	896.8	9.55
434.6	315.5	6.27	322.9	333.0	6.08	583.6	916.5	9.50
416.2	333.9	6.26	342.4	352.5	6.08	563.8	936.3	9.53
397.7	352.4	6.21	362.0	372.1	6.13	544.0	956.1	9.53
379.2	370.9	6.16	381.6	391.7	6.15	524.2	975.9	9.54
360.8	389.3	6.18	401.1	411.2	6.12	504.4	995.7	9.50
342.3	407.8	6.15	420.7	430.8	6.16	484.7	1015.4	9.44
323.8	426.3	6.17	440.2	450.3	6.20	464.9	1035.2	9.42
305.4	444.7	6.13	459.8	469.9	6.20	445.1	1055.0	9.45
286.9	463.2	6.18	479.3	489.4	6.20	425.3	1074.8	9.39
268.5	481.6	6.20	498.9	509.0	6.20	405.6	1094.5	9.38
250.0	500.1	6.22	518.4	528.5	6.20	385.8	1114.3	9.39
231.5	518.6	6.19	538.0	548.1	6.20	366.2	1134.1	9.25
213.1	537.0	6.20	557.1	567.2	6.22	346.4	1153.9	9.25
194.6	555.5	6.20	576.7	586.8	6.27	326.6	1173.7	9.26
176.2	573.9	6.19	596.7	606.8	6.35	306.7	1193.4	9.27
157.7	592.4	6.21	616.8	626.9	6.38	286.9	1213.0	9.32
139.2	610.9	6.20	636.9	647.0	6.42	267.1	1232.8	9.36
120.8	629.3	6.25	657.0	667.1	6.48	247.3	1252.3	9.36
102.3	647.8	6.27	677.1	687.2	6.54	227.5	1271.8	9.35
83.8	666.3	6.35	697.2	707.3	6.59	207.8	1291.3	9.35
65.4	684.7	6.35	717.3	727.4	6.67	188.0	1310.8	9.33
46.9	703.2	6.40	737.4	747.5	6.77	168.2	1330.3	9.33
28.5	721.6	6.42	757.5	767.6	6.95	148.4	1349.8	9.33
10.0	740.1	6.58	777.6	787.7	7.07	128.7	1369.3	9.33
			797.7	807.8		108.9	1388.8	9.33
			817.8	827.9		89.1	1408.3	9.33
			837.9	848.0		69.3	1427.8	9.33
			857.9	868.1		49.5	1447.3	9.33
			878.0	888.2		29.8	1466.8	9.33
			898.1	908.3		10.0	1486.3	9.33

REV. X2
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Frequency Mixer

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)					@LO (dBm)		
	+7	+10	+13	+7	+10	+13			+7	+10	+13
10.1	59.92	60.28	61.02	53.06	54.27	53.44	10.1	40.1	50.80	47.24	48.92
49.6	58.19	56.42	54.97	51.49	47.13	44.28	49.6	79.6	44.02	43.77	43.92
89.1	58.40	54.61	51.99	50.82	43.87	40.44	89.1	119.1	40.48	40.11	39.39
128.7	58.59	52.71	49.00	48.75	40.96	37.48	128.7	158.7	37.91	37.53	37.52
168.2	60.62	51.39	47.86	49.20	39.48	35.79	168.2	198.2	36.22	35.66	35.46
207.7	57.06	49.32	45.72	49.52	38.29	33.81	207.7	237.7	34.72	34.38	34.04
247.2	53.31	47.67	44.52	47.56	36.68	32.51	247.2	277.2	33.54	33.00	32.90
286.7	49.31	45.67	43.06	44.25	35.43	31.52	286.7	316.7	32.59	32.07	31.96
326.2	46.20	43.63	41.28	40.04	33.76	29.95	326.2	356.2	31.48	31.04	30.65
365.8	43.94	41.98	40.10	37.02	31.96	28.64	365.8	395.8	30.38	30.08	29.84
405.3	41.82	40.30	38.74	34.46	30.44	27.46	405.3	435.3	29.23	28.83	28.46
444.8	40.07	39.07	37.67	32.41	28.63	25.91	444.8	474.8	28.16	27.79	27.49
484.3	38.53	37.75	36.74	30.96	27.91	25.24	484.3	514.3	26.96	26.58	26.24
523.8	36.95	36.41	35.55	28.66	26.32	24.24	523.8	553.8	25.86	25.45	24.99
563.4	35.79	35.47	34.70	27.01	24.70	23.00	563.4	593.4	24.94	24.56	24.22
602.9	34.66	34.55	33.90	25.80	23.28	21.48	602.9	632.9	24.05	23.83	23.50
642.4	33.79	33.94	33.36	24.83	22.72	20.49	642.4	672.4	23.41	23.19	22.94
681.9	32.74	33.10	32.75	23.49	21.96	20.02	681.9	711.9	22.65	22.42	22.30
721.4	31.96	32.30	32.19	22.04	20.76	19.28	721.4	751.4	22.07	21.83	21.75
760.9	31.07	31.60	31.51	20.87	20.04	18.67	760.9	790.9	21.75	21.42	21.42
800.5	30.40	30.97	31.03	19.59	18.76	17.77	800.5	830.5	21.57	21.26	21.15
840.0	29.85	30.54	30.77	18.38	17.52	16.69	840.0	870.0	21.48	21.22	20.97
879.5	29.31	30.06	30.37	17.80	16.58	15.82	879.5	909.5	21.29	21.09	20.69
919.0	28.88	29.79	30.14	17.12	15.83	14.89	919.0	949.0	21.15	21.07	20.70
958.5	28.26	29.29	29.68	16.63	15.49	14.28	958.5	988.5	20.88	21.00	20.86
998.1	27.83	28.93	29.45	15.98	15.05	13.86	998.1	1028.1	20.56	20.88	20.89
1037.6	27.34	28.42	29.17	15.19	14.38	13.45	1037.6	1067.6	20.33	20.76	21.05
1077.1	26.85	28.00	28.79	14.47	13.91	13.05	1077.1	1107.1	20.03	20.50	20.99
1116.6	26.45	27.63	28.40	13.87	13.44	12.54	1116.6	1146.6	19.74	20.23	20.70
1156.1	25.97	27.13	27.92	13.30	12.95	12.12	1156.1	1186.1	19.36	19.80	20.25
1195.6	25.57	26.72	27.51	12.65	12.44	11.66	1195.6	1225.6	19.04	19.41	19.83
1254.9	25.05	26.12	26.95	11.86	11.69	11.11	1254.9	1284.9	18.68	19.01	19.36
1294.4	24.71	25.76	26.59	11.40	11.27	10.82	1294.4	1324.4	18.46	18.78	19.12
1353.7	24.25	25.37	26.18	10.59	10.73	10.38	1353.7	1383.7	18.31	18.50	18.66
1393.2	23.88	24.99	25.84	9.97	10.18	9.96	1393.2	1423.2	18.25	18.32	18.45
1452.5	23.47	24.52	25.46	9.38	9.57	9.52	1452.5	1482.5	18.00	18.05	18.20
1492.0	23.05	24.13	24.99	8.94	9.20	9.10	1492.0	1522.0	17.95	17.91	18.08
1551.3	22.57	23.62	24.44	8.43	8.76	8.68	1551.3	1581.3	17.73	17.78	17.97
1590.8	22.13	23.17	24.06	8.13	8.51	8.55	1590.8	1620.8	17.50	17.62	17.88
1650.1	21.53	22.48	23.27	7.67	8.12	8.18	1650.1	1680.1	17.37	17.56	17.76

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1500.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+7	+10	+13		+7	+10	+13		+7	+10	+13
10.1	40.1	1.62	1.60	1.60	10.1	1.83	2.64	3.88	10.1	1.24	1.03	1.17
49.6	79.6	1.20	1.14	1.14	49.6	1.90	2.80	3.96	29.9	1.14	1.06	1.22
89.1	119.1	1.14	1.07	1.07	89.1	1.82	2.64	3.69	49.7	1.13	1.08	1.23
128.7	158.7	1.13	1.04	1.03	128.7	1.86	2.71	3.82	69.4	1.08	1.11	1.26
168.2	198.2	1.12	1.04	1.01	168.2	1.83	2.66	3.69	89.2	1.11	1.08	1.23
207.7	237.7	1.13	1.05	1.04	207.7	1.86	2.68	3.74	109.0	1.11	1.07	1.24
247.2	277.2	1.16	1.10	1.07	247.2	1.90	2.73	3.76	128.8	1.12	1.07	1.23
286.7	316.7	1.19	1.13	1.11	286.7	1.90	2.71	3.70	148.5	1.12	1.08	1.24
326.2	356.2	1.22	1.16	1.14	326.2	1.99	2.81	3.83	168.3	1.11	1.08	1.25
365.8	395.8	1.25	1.20	1.18	365.8	2.01	2.80	3.76	188.1	1.11	1.08	1.25
405.3	435.3	1.29	1.24	1.23	405.3	2.06	2.85	3.80	207.9	1.11	1.08	1.26
444.8	474.8	1.34	1.29	1.27	444.8	2.14	2.91	3.82	227.7	1.12	1.09	1.26
484.3	514.3	1.41	1.36	1.34	484.3	2.17	2.92	3.81	247.4	1.11	1.10	1.27
523.8	553.8	1.48	1.43	1.41	523.8	2.25	2.99	3.86	267.2	1.11	1.11	1.29
563.4	593.4	1.56	1.50	1.47	563.4	2.30	3.01	3.84	287.0	1.11	1.10	1.29
602.9	632.9	1.66	1.59	1.55	602.9	2.36	3.06	3.86	306.8	1.11	1.10	1.29
642.4	672.4	1.77	1.70	1.65	642.4	2.43	3.11	3.89	326.5	1.10	1.12	1.32
681.9	711.9	1.89	1.82	1.77	681.9	2.48	3.15	3.90	346.3	1.09	1.14	1.34
721.4	751.4	2.03	1.96	1.91	721.4	2.55	3.18	3.90	366.1	1.10	1.13	1.33
760.9	790.9	2.17	2.08	2.04	760.9	2.61	3.21	3.91	385.9	1.10	1.13	1.33
800.5	830.5	2.30	2.18	2.14	800.5	2.69	3.26	3.92	405.7	1.10	1.15	1.36
840.0	870.0	2.48	2.32	2.26	840.0	2.77	3.29	3.89	425.4	1.10	1.15	1.37
879.5	909.5	2.63	2.48	2.38	879.5	2.85	3.37	3.95	445.2	1.08	1.16	1.38
919.0	949.0	2.81	2.64	2.52	919.0	2.92	3.43	3.98	465.0	1.06	1.17	1.40
958.5	988.5	2.97	2.80	2.66	958.5	2.98	3.47	4.01	484.8	1.07	1.17	1.40
998.1	1028.1	3.12	2.95	2.80	998.1	3.04	3.52	4.05	504.5	1.08	1.16	1.39
1037.6	1067.6	3.24	3.12	2.99	1037.6	3.10	3.56	4.04	524.3	1.07	1.18	1.42
1077.1	1107.1	3.34	3.27	3.17	1077.1	3.14	3.56	4.04	544.1	1.05	1.20	1.45
1116.6	1146.6	3.38	3.36	3.31	1116.6	3.19	3.58	4.02	583.7	1.05	1.20	1.45
1156.1	1186.1	3.42	3.42	3.40	1156.1	3.24	3.60	4.01	603.4	1.05	1.21	1.46
1195.6	1225.6	3.42	3.45	3.45	1195.6	3.26	3.59	3.99	643.0	1.05	1.22	1.48
1254.9	1284.9	3.46	3.48	3.50	1254.9	3.37	3.62	3.98	662.8	1.03	1.24	1.51
1294.4	1324.4	3.50	3.52	3.54	1294.4	3.41	3.62	3.96	702.3	1.05	1.24	1.50
1353.7	1383.7	3.52	3.54	3.56	1353.7	3.54	3.69	3.95	722.1	1.04	1.25	1.51
1393.2	1423.2	3.55	3.56	3.58	1393.2	3.57	3.67	3.89	761.7	1.04	1.27	1.54
1452.5	1482.5	3.58	3.56	3.59	1452.5	3.70	3.71	3.89	781.4	1.04	1.26	1.53
1492.0	1522.0	3.59	3.55	3.57	1492.0	3.76	3.71	3.85	821.0	1.06	1.29	1.54
1551.3	1581.3	3.60	3.52	3.53	1551.3	3.95	3.77	3.86	840.8	1.06	1.29	1.55
1590.8	1620.8	3.67	3.54	3.52	1590.8	3.98	3.86	3.91	880.3	1.06	1.32	1.59
1650.1	1680.1	3.74	3.53	3.49	1650.1	4.09	3.93	3.94	900.1	1.08	1.33	1.59

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Frequency Mixer

LRMS-5LHJ

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	1	24	23	48	22	50	40	59	53	67
1	-	15	+0	41	19	48	38	57	40	59	49	74
2	81	42	23	49	24	47	44	60	42	63	53	64
3	>100	45	39	49	35	50	42	63	51	69	50	83
4	>100	65	58	50	46	56	39	62	59	60	63	67
5	>100	63	61	72	51	51	54	60	52	78	56	64
6	>100	80	83	73	69	66	51	59	59	66	67	67
7	>100	>94	76	>94	82	81	63	60	67	61	64	82
8	>100	93	91	85	81	78	89	82	63	63	66	72
9	>100	>94	>94	>94	83	80	84	80	77	72	65	66
10	>100	>94	>94	>94	>94	92	83	85	85	75	74	73
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; 0.00 dBm.
LO IN: 780.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -6.46 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+7	12	12	36	10	34	28	41	39	50
1	-	15	+0	39	17	48	31	45	33	61	45	62
2	>100	50	32	51	31	58	48	56	46	56	57	61
3	>100	69	59	59	62	61	57	>84	58	64	61	71
4	>100	>84	>84	83	71	81	70	79	80	77	73	75
5	>100	>84	>84	>84	>84	>84	>84	83	>84	>84	83	>84
6	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
7	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
8	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
9	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
10	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -10.00 dBm.
LO IN: 780.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -16.26 dBm

- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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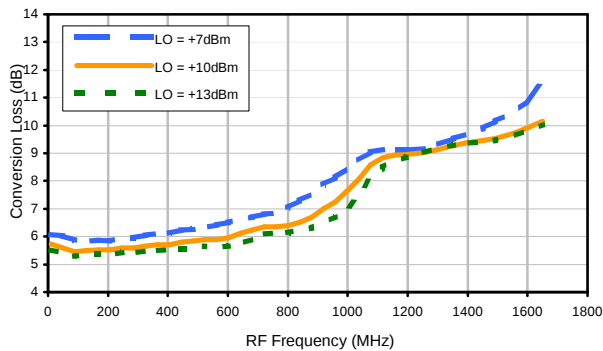


Frequency Mixer

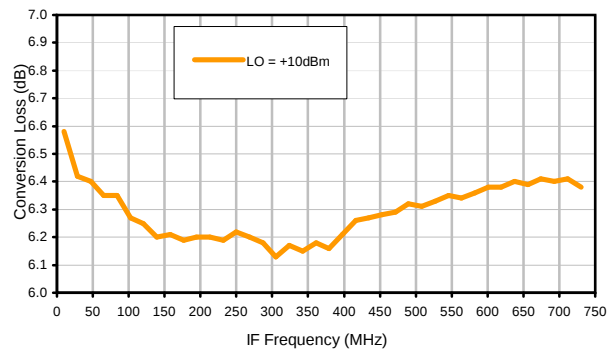
LRMS-5LHJ

Typical Performance Curves

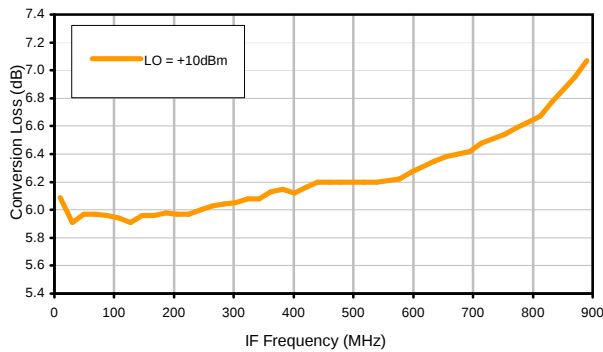
Conversion Loss @ IF=30MHz



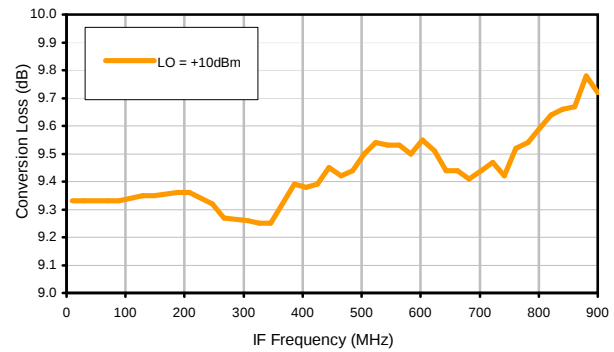
Conversion Loss vs. IF @ RF=750.1MHz



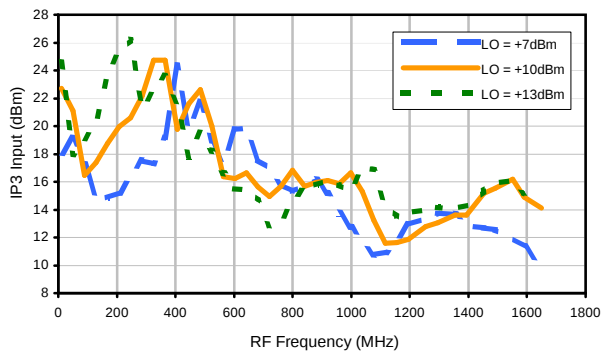
Conversion Loss vs. IF @ RF=10.1MHz



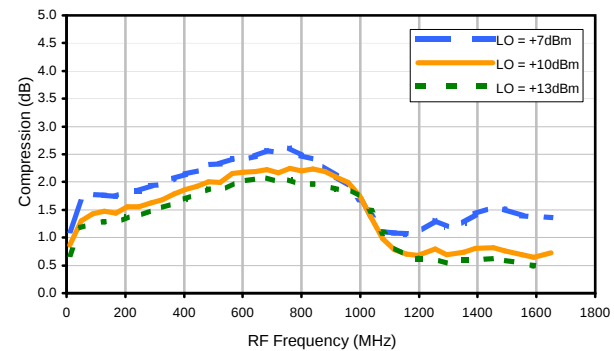
Conversion Loss vs. IF @ RF=1500.1MHz



IP3 Input



Compression @ RF IN=+5dBm



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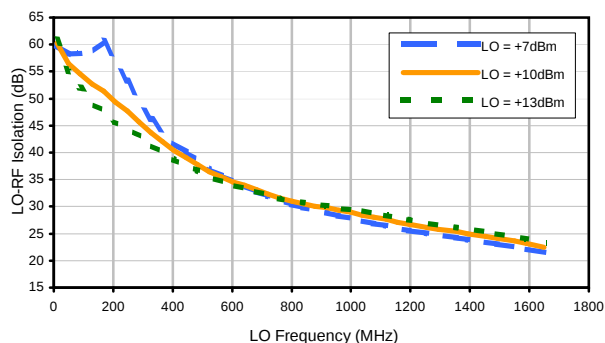


Frequency Mixer

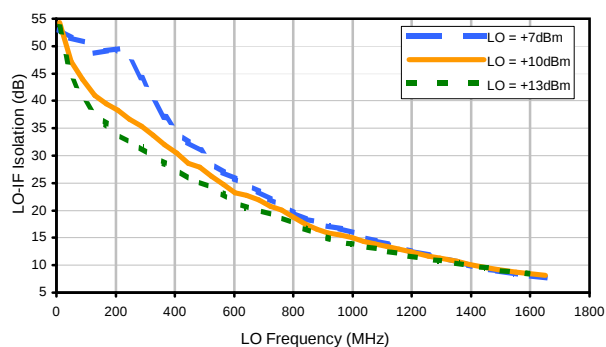
LRMS-5LHJ

Typical Performance Curves

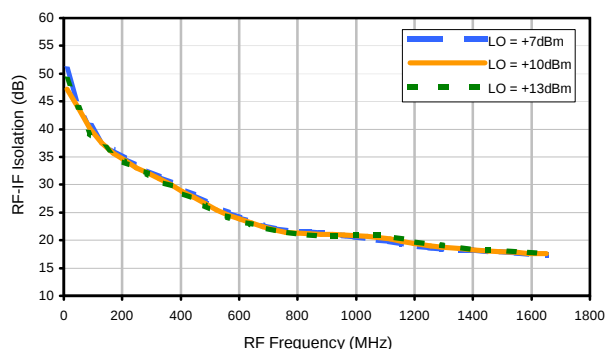
LO-RF Isolation



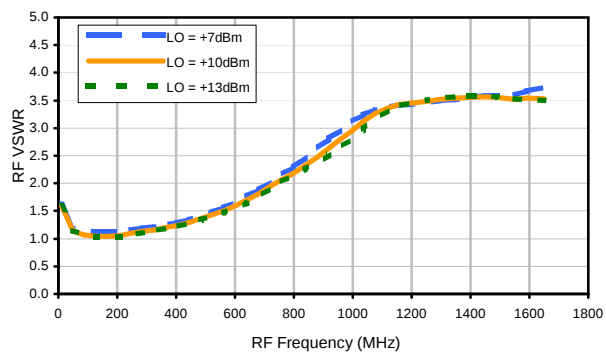
LO-IF Isolation



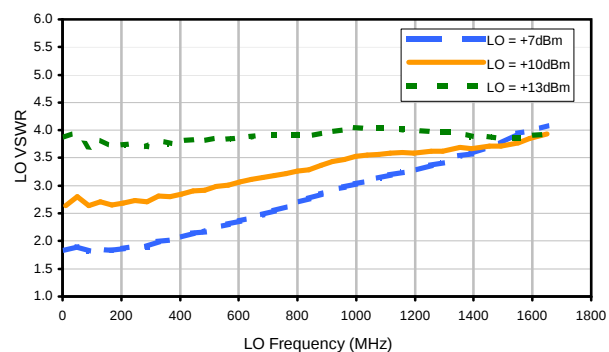
RF-IF Isolation



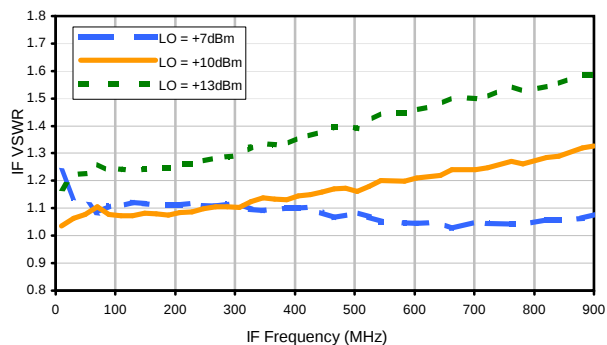
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	1	24	23	48	22	50	40	59	53	67
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2	81	42	23	49	24	47	44	60	42	63	53	64
3	>100	45	39	49	35	50	42	63	51	69	50	83
4	>100	65	58	50	46	56	39	62	59	60	63	67
5	>100	63	61	72	51	51	54	60	52	78	56	64
6	>100	80	83	73	69	66	51	59	59	66	67	67
7	>100	>94	76	>94	82	81	63	60	67	61	64	82
8	>100	93	91	85	81	78	89	82	63	63	66	72
9	>100	>94	>94	>94	83	80	84	80	77	72	65	66
10	>100	>94	>94	>94	>94	92	83	85	85	75	74	73
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; 0.00 dBm.
LO IN: 780.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -6.46 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
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1	-	15	+0	39	17	48	31	45	33	61	45	62
2	>100	50	32	51	31	58	48	56	46	56	57	61
3	>100	69	59	59	62	61	57	>84	58	64	61	71
4	>100	>84	>84	83	71	81	70	79	80	77	73	75
5	>100	>84	>84	>84	>84	>84	>84	83	>84	>84	83	>84
6	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
7	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
8	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
9	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
10	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -10.00 dBm.
LO IN: 780.01 MHz; +10.00 dBm
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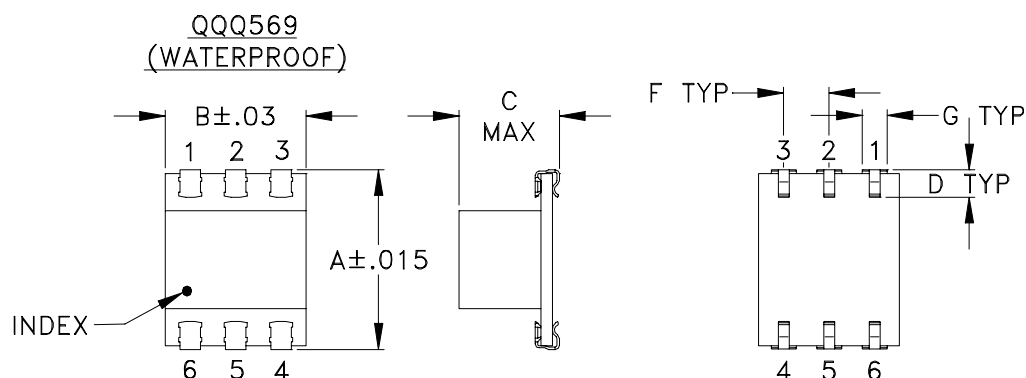


Case Style

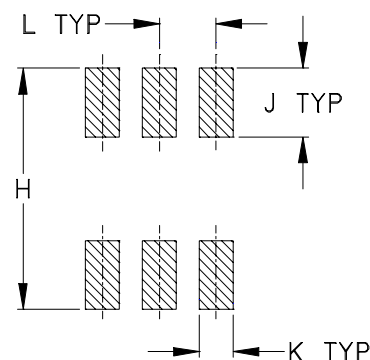
QQQ

QQQ569 (waterproof)

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT, GRAM
QQQ569	.390 (9.90)	.31 (7.87)	.225 (5.72)	.060 (1.52)	-	.100 (2.54)	.045 (1.14)	.420 (10.67)	.120 (3.05)	.060 (1.52)	.100 (2.54)	-	.50

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .01$; 3 Pl. $\pm .005$

Notes:

- Case material: Ceramic.
- Termination finish:
 - For RoHS Case Styles: Tin plate over Nickel plate.
 - For RoHS-5 Case Styles: Tin-Lead plate.



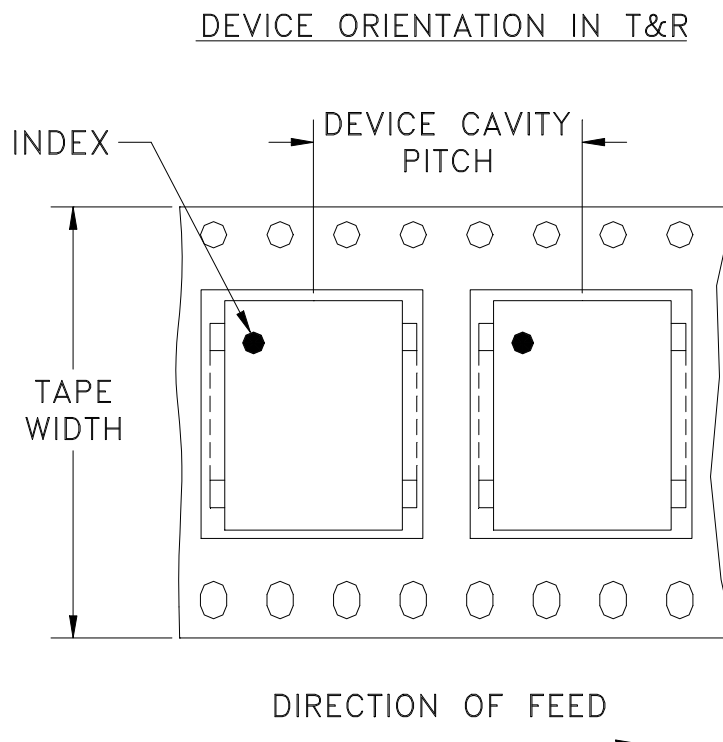
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Tape & Reel Packaging TR-F5



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	16	13	500

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf



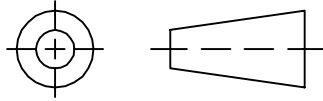
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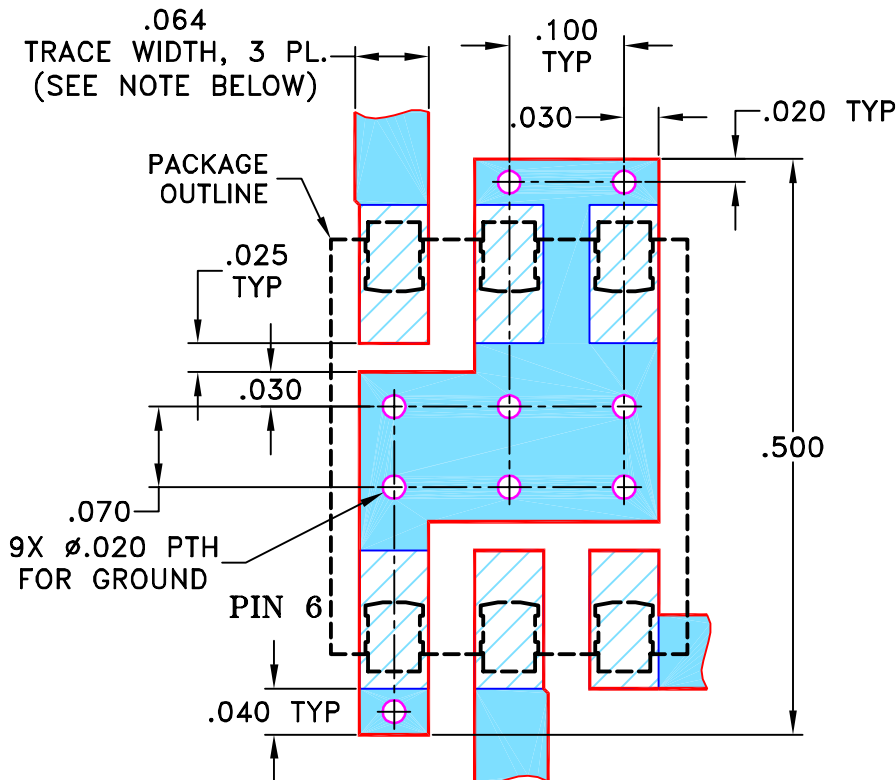
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M82272	NEW RELEASE	08/02/02	AV	DJ
A	M102713	UPDATED NOTES	01/14/06	GF	IL

SUGGESTED MOUNTING CONFIGURATION FOR QQQ569 CASE STYLE, "w" PIN CONNECTION



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" $\pm$ 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

DRAWN

AV

07/19/02

TOLERANCES ON:

CHECKED

WL

08/02/02

2 PL DECIMALS $\pm$.005

APPROVED

DJ

08/02/02

ANGLES $\pm$

FRACTIONS $\pm$

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ASHEETA1.DWG REV:A DATE:01/12/95



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Brooklyn NY 11235

PL, w, QQQ569, LRMS-J, TB-44

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-083

REV:

A

FILE: 98PL083

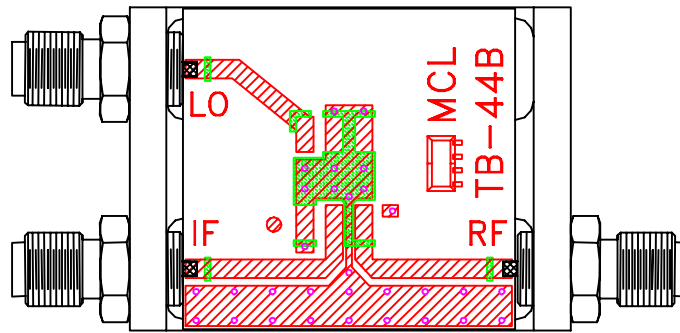
SCALE:

6:1

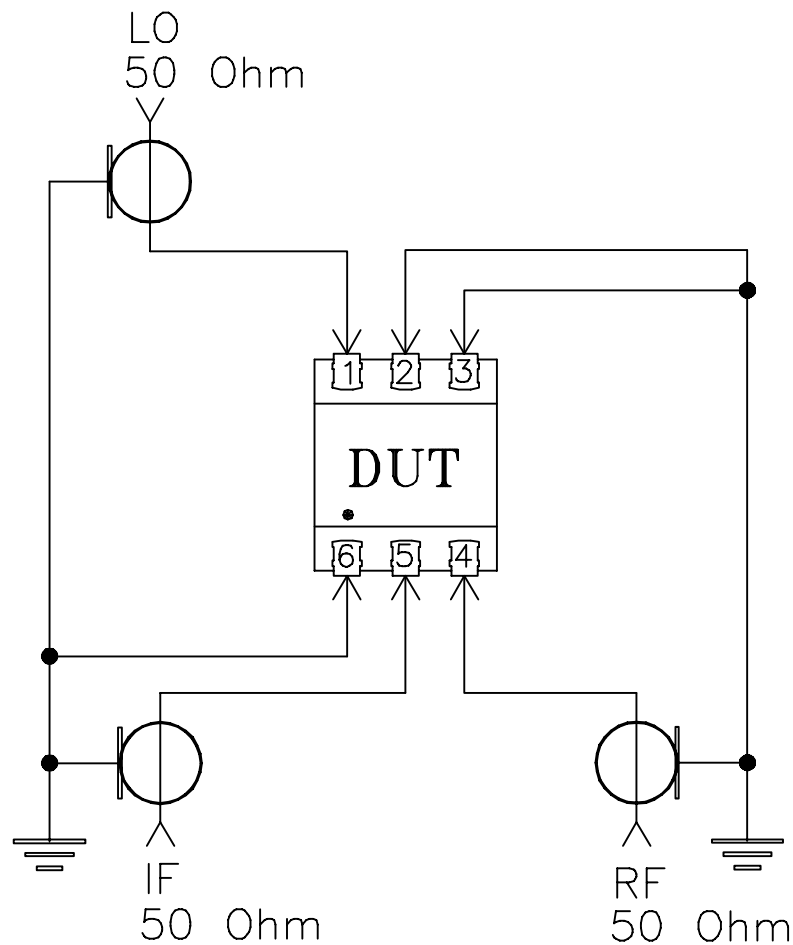
SHEET:

1 OF 1

Evaluation Board and Circuit



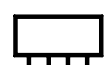
TB-44+



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.030 inch.

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